What Is Claimed Is:

1.   A long period grating where the refractive index in a predetermined range is periodically modulated in a several hundred μm order along the longitudinal direction of an optical wave guide, wherein a plurality of first areas are arranged discretely in said predetermined range, and the refractive index at each position in said first area is modulated to a refractive index that is the same as the refractive index modulated at a first period all through said predetermined range.

2.   The long period grating according to Claim 1, wherein the deviation of the lengths of said first areas and the deviation of the lengths between the first areas are both smaller than double that of said first period.

3.   The long period grating according to Claim 1, wherein the amplitude of the refractive index modulation of each area of said first areas is the same as one another.

4.   The long period grating according to Claim 1, comprising one or more area groups of a plurality of areas arranged in an area other than said first areas in said predetermined range, wherein the refractive index at each position of each area has been modulated to a refractive index the same as the refractive index

modulated at a unique period which is different from said first period, all through said predetermined range.

5.   The long period grating according to Claim 4, wherein the areas of each group are sequentially arranged without space in said predetermined range.

6.   The long period grating according to Claim 4, wherein the deviation of the lengths of each one of said areas and the deviation of the lengths between each area are set to values smaller than double that of the refractive index period of said area in said predetermined range.

7.   The long period grating according to Claim 4, wherein the amplitude of the refractive index modulation of each one of said areas is the same within a same group.

8.   The long period grating according to Claim 7, wherein the amplitude of the refractive index modulation of each one of said areas is the same.

9.   The long period grating according to Claim 7, wherein a second area is arranged between said first areas respectively, and the following four equations are satisfied where the arrangement period of said first areas and second areas is L_0, the setting length is L_1 and L_2 respectively, the refractive index period is Λ_1 and Λ_2 respectively, the refractive index period of the long period grating to be required for obtaining

a loss peak at the shortest wavelength of the wavelength band in use is Λ_S, and the refractive index period of the long period grating to be required for obtaining a loss peak at the longest wavelength of said

5 band is Λ_L.

$$\frac{\Lambda_1 L_0}{L_0 + \Lambda_1} < \Lambda_s$$

$$\frac{\Lambda_2 L_0}{L_0 + \Lambda_2} < \Lambda_s$$

$$\Lambda_L < \frac{\Lambda_1 L_0}{L_0 - \Lambda_1}$$

$$\Lambda_L < \frac{\Lambda_2 L_0}{L_0 - \Lambda_2}$$

10. A making method of a long period grating , comprising steps of:

preparing a first intensity modulation mask

10 where a mask pattern is created according to a predetermined period in the entire area along a predetermined range, and a second intensity modulation mask where light blocking sections are arranged between a plurality of light transmission sections along the

15 predetermined range;

overlaying these two intensity modulation masks on each other and placing them on a processing target optical wave guide; and

creating a long period grating by irradiating

20 a refractive index change inducing light which transmits through these two masks on said optical wave

guide to cause the refractive index change.

11. The long period grating manufacturing method according to Claim 10, wherein a plurality of masks with different mask patterns are prepared as first intensity modulation masks, a plurality of masks with a different arrangement of light transmission sections are prepared as second intensity modulation masks, and the arrangement of masks and the irradiation of refraction index change inducing light are repeated with changing the combination of the first intensity modulation mask and the second intensity modulation mask.

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